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- (Not claimed before, c/s
in. revised)

7. The system of claim 1 wherein the shoes and the sash support arms are each cut from metal extrusions.

8. The system of claim 7 wherein the shoes are cut to different widths to fit different jamb channels.

5 9. The system of claim 8 wherein the shoes are configured to connect to different numbers of counterbalance elements.

10. The system of claim 7 wherein the sash support arms are extruded in different lengths to fit different jamb dimensions.

10 11. The system of claim 10 wherein the different sash support arms are extruded with code lines indicating size.

12. In a counterbalance system for a window sash supported by a pair of counterbalanced sash shoes so that the sash extends between a pair of jambs from which the sash is removable by maneuvering the sash upward and laterally while the shoes are
15 locked in the jambs, the improvement comprising:

- a. the shoes being formed of metal extrusions cut to shoe width;
- b. upper regions of the shoe extrusions being interconnected with counterbalance elements; and
- 20 c. lower regions of the shoe extrusions supporting the sash.

13. The improvement of claim 12 wherein the sash is supported on the shoes by sash support arms cut from metal extrusions.

25 14. The improvement of claim 13 wherein the sash support arms are movably mounted on the sash to rest on the shoes in outwardly extending positions of the sash support arms.

15. The improvement of claim 13 wherein the sash support arms are mounted on the sash to pivot between outwardly extending positions and inwardly dependent positions.

16. The improvement of claim 12 wherein the shoes include locking elements that engage the jambs to lock the shoes during sash removal and replacement.

17. The improvement of claim 16 wherein the locking
5 elements are cut from metal extrusions and are pivotally mounted on the shoes.

18. The improvement of claim 16 wherein the shoes have latches that latch the locking elements in undeployed positions.

19. The improvement of claim 12 including mid-regions of
10 the shoe extrusions having guides that slide in the jambs to guide vertical movement of the shoes.

20. The improvement of claim 19 wherein the shoe extrusions are configured with retaining grooves that receive the guides.

21. The improvement of claim 20 wherein the shoe
15 extrusions have retaining grooves for receiving hook latches and pin grooves for receiving pins of shoe hooks.

22. The improvement of claim 12 wherein the shoes are cut to different widths to fit different sizes of jamb channels.

23. The improvement of claim 22 wherein shoes of different
20 widths are configured to interconnect to different numbers of counterbalance elements.

24. The improvement of claim 13 wherein the sash support
25 arms are extruded in different lengths to accommodate different distances between opposite shoes.

25. The improvement of claim 24 wherein different lengths of sash support arms are extruded with code lines indicating size.

26. A method of removing a window sash from between
30 opposed window jambs where the sash is supported on a pair of counterbalanced shoes arranged for moving within the jambs, the method comprising:

- 5
- a. releasing shoe hooks from latched positions on each of the shoes to deploy the hooks to hang dependently from the shoes;
 - b. raising the sash and the shoes so that the hooks move upward from positions below lances in the jambs and engage the lances in the dependent positions of the hooks to lock the shoes against upward movement; and
 - c. lifting the sash above the hook-locked shoes and laterally withdrawing the sash from between the jambs.

10 27. The method of claim 26 including releasing a spring clip for unlatching the shoe hooks.

28. The method of claim 26 wherein releasing the shoe hooks allows the shoe hooks to pivot downward to deployed positions where tips of the hooks engage the jambs.

- 15 *Sub 62*
- 29. A counterbalance sash shoe comprising:
 - a. an extruded metal body cut to shoe width;
 - b. an upper region of the extruded body being configured to interconnect with a counterbalance; and
 - c. a lower region of the extruded body being configured as a platform to support a sash.
- 20

30. The shoe of claim 29 including a locking hook mounted on the shoe for locking the shoe when the hook is deployed. *no means provided*

31. The shoe of claim 30 wherein the hook is formed of a metal extrusion cut to hook width.

25 32. The shoe of claim 30 including a spring latch for retaining the hook in an undeployed position.

33. The shoe of claim 32 wherein the hook is manually movable to a latched engagement with the spring latch and is unlatched from the spring latch with a tool.

30 34. The shoe of claim 30 wherein the shoe body is formed with a pin groove for receiving a pin for pivoting the hook and a spring groove for retaining the spring latch.

35. The shoe of claim 29 including a guide mounted on the shoe between the platform and the interconnect region, the guide being formed of resin material.

5 36. The shoe of claim 35 wherein a mid-region of the shoe body is formed with an interlock for holding the guide.

37. The shoe of claim 29 wherein the shoes are cut to different widths to fit different sizes of jamb channels.

10 38. The shoe of claim 37 wherein different widths of shoes are configured to connect to different numbers of counterbalance elements.

39. A sash support system comprising:

- 15 a. a plurality of sash support elements cut from metal extrusions having different cross-sectional shapes;
- b. a first one of the extruded elements being configured as a shoe having an upper region engaging a counterbalance and a lower region supporting a sash; and
- c. a second one of the extruded elements being configured as a sash support arm connected to a stile of the sash to engage the sash support region of the shoe.

20 40. The system of claim 39 including a third one of the extruded elements being configured as a shoe lock connectable to a lower region of the shoe to be movable between deployed and undeployed positions.

25 41. The system of claim 40 wherein the shoe is configured with a pin groove for receiving a pivot pin supporting the shoe lock.

42. The system of claim 40 including a resilient latch for retaining the shoe lock in the undeployed position.

30 43. The system of claim 42 wherein the hook and the latch are configured so that the hook is manually latchable and is unlatchable with a tool.

44. The system of claim 41 wherein the shoe lock is pivotally movable and is downwardly dependent in the deployed position.

45. The system of claim 39 including a resin guide mounted on the shoe for guiding vertical travel of the shoe.

46. The system of claim 45 wherein a mid-region of the shoe is configured with a locking slot for receiving the resin guide.

47. The system of claim 39 wherein the sash support arm is pivotally mounted on the sash stile to move between downwardly dependent and outwardly extending positions.

48. The system of claim 47 wherein the sash support arm is braced from moving beyond the outwardly extending position.

49. The system of claim 39 wherein the shoe is cut from an extrusion in different widths to accommodate different jamb shoe channels.

50. The system of claim 49 wherein different width shoes are configured for connecting to different numbers of counterbalance elements.

51. The system of claim 39 wherein the sash support arm is selected from a plurality of extrusions of different widths.

52. The system of claim 51 wherein extrusions for different lengths of sash support arms are formed with code lines indicating arm length.

53. A sash support comprising:

- a. sash support arms movably mounted respectively on each stile of the sash;
- b. the support arms being movable between inward and outward positions; and
- c. end regions of the support arms in the outward positions resting on respective sash shoes that are counterbalanced to support the sash.

54. The support of claim 53 wherein the support arms are pivotally mounted on the sash stiles and are limited to movement between the inward and outward positions.

55. The support of claim 53 wherein the support of the sash on the sash arms allows the sash to be lifted and maneuvered laterally for withdrawal from a window.

56. The support of claim 53 wherein counterbalance lift is applied to the shoes above the end regions of the support arms resting on the shoes.

57. The support of claim 53 wherein the support arms are pivotally mounted on brackets that are secured to the sash stiles, and the support arms engage the brackets to limit the movement of the support arms to the inward and outward positions.

58. The support of claim 53 wherein the sash support arms are cut from metal extrusions.

59. The support of claim 58 wherein extrusions for the support arms are formed in different lengths and provided with extruded coding lines indicating support arm length.

60. The support of claim 53 wherein the shoes are cut from metal extrusions.

61. A system for locking counterbalance shoes to window jambs while a sash supported on the shoes is removed from between the window jambs, the locking system comprising:

- a. the shoes having hooks that are pivotally mounted on lower regions of the shoes to move between latched and unlatched positions;
- b. the hooks in unlatched positions being dependent from the shoes to engage the jambs and hook under lances formed in the jambs; and
- c. the hooks in latched positions being retained out of engagement with the jambs.

112
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62. The system of claim 61 wherein resilient latches are carried on the shoes for holding the hooks in latched positions.

63. The system of claim 62 wherein the hooks are manually movable into the latched positions and are released from the latched positions with the aid of a tool.

64. The system of claim 61 wherein the hooks and the shoes are formed of metal extrusions.

65. The system of claim 64 wherein the shoes have extrusion-formed grooves that receive pivot pins for the hooks.

66. The system of claim 65 wherein the shoes have extrusion-formed slots that retain resilient latches for holding the hooks in latched positions.

67. A support system for a sash that is laterally removable from between opposed window jambs and is supported on counterbalanced shoes that run vertically within the jambs and are separated sufficiently to allow lateral movement of the sash, the support system comprising:

- a. the shoes having platforms that extend toward the sash to support the sash;
- b. the sash having a support arm secured to each sash stile and extending outward from the sash to engage the shoe platforms; and
- c. the sash support arms being mounted on the sash to pivot between inwardly dependent positions in which the sash support arms engage sash end regions of the shoe platforms and outwardly extending positions in which the sash support arms engage jamb end regions of the shoe platforms.

68. The system of claim 67 wherein counterbalance lifts are applied to the shoes above the jamb end regions of the platforms.

69. The system of claim 67 wherein the sash support arms are braced against movement beyond the downwardly dependent positions and the outwardly extending positions.

70. The system of claim 67 wherein the sash support arms are cut from metal extrusions.

71. The system of claim 70 wherein the extrusions are made in different lengths to accommodate the sash to different window dimensions.

72. The system of claim 71 wherein the extrusions are formed with coding lines to indicate the length of the sash support arms.

73. The system of claim 67 wherein the shoes are cut from metal extrusions.

74. A counterbalance system for a laterally removable sash supported by counterbalanced sash shoes respectively running vertically in opposed jambs arranged along opposite stiles of the sash, the counterbalance system comprising:

- a. movable support arms extending between the sash and sash shoes biased upward at lifting regions spaced from each sash stile, the support arms being arranged for transferring the weight of the sash to the shoes at support regions vertically below the lifting regions; and
- b. the support arms being movable to allow lateral movement of the sash between the lifting regions for withdrawal from the jambs when the weight of the sash is lifted from the shoes.

75. The system of claim 74 wherein the support arms are pivotally movable and are braced in a support position to block pivoting movement when the support arms are transferring the weight of the sash to the support regions of the shoes.

76. The system of claim 74 wherein the shoes are cut from metal extrusions.

77. The system of claim 74 wherein the sash support arms are cut from metal extrusions.

78. The system of claim 77 wherein the extrusions are made in different lengths to accommodate the sash to different window dimensions.

79. The system of claim 74 wherein the support arms are
5 pivotally mounted on the sash stiles.

80. A support system for a sash that runs vertically within an opposed pair of window jambs containing counterbalance sash shoes, the sash being movable laterally of the jambs for withdrawing the sash from between the jambs, and the support
10 system comprising:

- a. a pair of movable support arms engaging the sash and the counterbalance shoes and arranged for transferring the weight of the sash to support regions of the counterbalance shoes;
- 15 b. the support arms being movable to allow lateral movement of the sash when the sash is lifted to remove its weight from the support regions; and
- c. the counterbalance shoes being biased upward at lifting regions arranged vertically above the support regions.

81. The system of claim 80 wherein the support arms are
20 braced against movement when the support arms transfer the sash weight to the support regions.

82. The system of claim 80 wherein the shoes are cut from metal extrusions.

83. The system of claim 80 wherein the sash support arms
25 are cut from metal extrusions.

84. The system of claim 83 wherein the extrusions are made in different lengths to bridge different distances between stiles of the sash and the support regions.

85. The system of claim 80 wherein the support arms are
30 pivotally movable on opposite stiles of the sash.

86. A support system for a sash that is laterally removable from between opposed window jambs, the support system including counterbalance shoes arranged within the jambs to be spaced laterally from stile edges of the sash to allow lateral movement of the sash for removing the sash from between the jambs, and the support system comprising:

- a. sash support arms arranged for bridging distances between the shoes and stiles of the sash, the support arms being movable between sash supporting positions in which the support arms transfer weight of the sash to the shoes and sash uplifted positions in which the support arms allow lateral movement of the sash;
- b. counterbalance lifting regions for the shoes being arranged vertically above support regions that uphold the weight of the sash transferred via the support arms to the shoes; and
- c. the sash support arms in the support positions being braced against moving in response to sash weight.

87. The system of claim 86 wherein the shoes are cut from metal extrusions.

88. The system of claim 86 wherein the sash support arms are cut from metal extrusions.

89. The system of claim 88 wherein the extrusions are made in different lengths to bridge different distances between stiles of the sash and the support regions.

90. The system of claim 86 wherein the support arms are pivotally movable on opposite stiles of the sash.